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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/902,806	07/12/2001	Nicholas J. Frigo	03493.00111	6654

26652 7590 06/30/2005

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EXAMINER	
SEDIGHIAN, REZA	

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 06/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/902,806	FRIGO ET AL.	
	Examiner	Art Unit	
	M. R. Sedighian	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 14-32* is/are rejected.

7)☒ Claim(s) *13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/31/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. This communication is responsive to applicant's 4/15/05 amendments and remarks. The amendments have been entered. Claims 1-32 are now pending.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claims 1 and 20, each recites the limitation "the only optical carrier signals" in line 6. There is insufficient antecedent basis for this limitation in each claim.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-7, 10-11, 17, 20-27, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. (US Patent No: 6,616,349) in view of Frigo (US Patent No: 6,222,654).

Regarding claims 1 and 20, as it is understood in view of the above 112 problem, Li teaches a WDM fiber ring network architecture (10, fig. 2) for communicating information into a metro access area (22, 41, 43, fig. 2) using one or more wavelengths (col. 4, lines 20-31), which can be shared by a plurality of user terminals (col. 4, lines 30-49), comprising: a fiber optical

feeder ring (20, fig. 2); at least one fiber optical distribution ring (30, 40, fig. 2); a network node (21, fig. 2) for providing only optical carrier signals transmitted across the optical feeder ring and the optical fiber distribution ring (col. 4, lines 50-61); at least one access node (50, fig. 2) for permitting only selected wavelengths of the optical carrier signals to be transmitted along the fiber distribution ring (col. 5, lines 35-40, col. 6, lines 1-5, 12-17), wherein the network node (21, fig. 2) and the access node (50, fig. 2) are connected via the optical fiber feeder ring (20, fig. 2); and at least one end station (col. 4, lines 40-46 and 32, fig. 2) connected via the optical distribution ring (30, fig. 2) to the access node (50, fig. 2). Li differs from the claimed invention in that Li does not specifically disclose a user terminal of the plurality of user terminals being attached to the End station. Li teaches communication between client networking elements such as IOF client 32 (col. 4, lines 62-63). Li further teaches IOF client 32 comprises of transmitters and receivers (32, TXs, RXs, fig. 25). Frigo teaches an optical add/drop multiplexer node (188, fig. 4) that is connected to a user terminal (209, fig. 4 and col. 4, lines 42-55). Accordingly, it would have been obvious to a person of ordinary skill in the art at the time of invention that IOF client 32 of Li that is comprised of transmitters and receivers can be connected to a terminal or to a user terminal, as it is taught by Frigo, to receive and retrieve the transmitted signal and to provide further signal processing or measurements. As to claim 20, Li further teaches a pair of counter-propagating fiber optical feeder rings (20, fig. 2, note that ring 20 has a pair of counter-propagating fibers, as it is shown in fig. 2).

Regarding claims 2-3, Li teaches the fiber optical feeder ring and the distribution ring are transparent (col. 4, lines 29-32).

Regarding claim 4, Li teaches the feeder ring is unidirectional (the transmission of signal from node 21 to interface 50 through ring 20 is unidirectional).

Regarding claims 5, 22-23, and 25, Li further teaches the network node (21, figs. 2, 10) comprises of a plurality of WDM sources (TXs, fig. 10), a plurality of WDM receivers (RXs, fig. 10), a multiplexer (120, fig. 10), and a demultiplexer (110, fig. 10).

Regarding claims 6 and 26-27, Li further teaches the access node (50, fig. 2) comprises of an optical add-drop multiplexer (OADM, 50, fig. 3 and 50', 71, 72, fig. 8), wherein the OADM defines distribution loops in which a single wavelength forms a virtual ring that is being accessible by the end station (col. 6, lines 1-21).

Regarding claim 7, Li teaches the OADM is static (col. 6, lines 11-17).

Regarding claim 10, Li teaches the OADM is reconfigurable (col. 8, lines 25-33).

Regarding claim 11, Li differs from the claimed invention in that Li does not disclose the access node comprises of an optical amplifier for amplifying the signals. Frigo further teaches an access node (188, 194, fig. 4) that is connected to an optical amplifier (192, 228, fig. 4). It is well known to incorporate optical amplifiers along the transmission lines, or at the nodes of a network, or at interfaces between the nodes of a network in order to boost the signal strength. Therefore, it would have been obvious to an artisan at the time of invention to incorporate an optical amplifier such as the ones of Frigo in the interface 50, or in the access node 50 of Li to boost the signal strength and to increase the transmission distance.

Regarding claim 17, Li teaches the WDM sources and the multiplexer create data packets at a wavelength and the data packets being sent downstream over the fiber ring and one of the receivers detect data packet (col. 4, lines 50-61, col. 6, lines 12-15 and 32, RX, fig. 25).

Regarding claim 21, Li further teaches a pair of counter-propagating fiber distribution ring (30, fig. 2, note that distribution ring 30 has a pair of counter-propagating fibers, as it is shown in fig. 2).

Regarding claim 24, Li further teaches a plurality of WDM transceivers (21, TXs, RXs, fig. 10) for each pair of counter-propagating fiber optical feeder ring (20, fig. 2), an optical splitter (110, fig. 10), and an optical filter (col. 6, lines 40-56).

Regarding claim 32, Li further teaches the pair of counter-propagating fiber optical feeder ring allow protection from a single point of failure such that signal transmission is preserved (col. 2, lines 24-35, col. 6, lines 57-67, col. 7, lines 1-11).

6. Claims 8-9, 28, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. (US Patent No: 6,616,349) in view of Frigo (US Patent No: 6,222,654) and in further view of Mesh (US Patent No: 6,256,431), or Laming et al. (US Patent No: 6,278,818).

Regarding claims 8-9, 28, and 30, the modified communication system of Li and Frigo differs from the claimed invention in that Li and Frigo do not disclose the OADM consists of pairs of waveguide grating routers. Mesh teaches an OADM (40, fig. 5 and col. 5, lines 64-67, col. 6, lines 1-18) that consists of pairs of waveguide grating routers (44, 48, fig. 5 and col. 7, lines 20-30). Laming teaches an OADM (fig. 5) that consists of a single waveguide grating routers (col. 3, lines 24-25, col. 4, lines 64-67). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate an OADM such as the one of Mesh, or Laming for the add-drop multiplexers in the modified communication system of Li and Frigo to provide an add-drop multiplexer with a predefined free space range to separate the higher wavelengths from the lower wavelengths.

7. Claims 12, 14, 16, and 18-19, are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. (US Patent No: 6,616,349) in view of Frigo (US Patent No: 6,222,654), or in view of Mizrahi (US Patent No: 6,509,986).

Regarding claim 12, 14, and 16, Li differs from the claimed invention in that Li does not disclose the End station comprises of an optical amplifier used as a channel equalizer to compensate for the loss in the distribution loop and associated components. Frigo teaches an access node (188, 194, fig. 4) that is connected to an optical amplifier (192, 228, fig. 4). Likewise, Mizrahi teaches a ring network (110, fig. 1) having a node (114, fig. 3) with an optical amplifier (399, fig. 3). Therefore, it would have been obvious to an artisan at the time of invention to incorporate an optical amplifier such as the ones of Frigo or Mizrahi in the End station 32 of Li in order to boost the signal strength and to reshape the signal. Regarding claims 14 and 16, Li discloses the end station (32, fig. 2) comprises of a receiver (32, RX, fig. 25) for receiving the information signal (col. 7, lines 40-45). As to a semiconductor optical amplifier, Mizrahi teaches a semiconductor optical amplifier (399, fig. 3). It would have been obvious to a person of ordinary skill in the art to incorporate an optical amplifier such as the one of Mizrahi in an End station such as client node 32 of Li in order to reshape and amplify the signal for further transmission.

Regarding claim 18, Li discloses the end station (32, figs. 2, 25) further comprises of a passive splitter which taps a portion of the light to a receiver (note that the optical signal received by node 32 is demultiplexed and the optical signal further received by the receiver RX, shown in fig. 25).

Regarding claim 19, Li discloses the receiver converts the optical signal to electrical signal (col. 6, lines 35-38).

8. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. (US Patent No: 6,616,349) in view of Frigo (US Patent No: 6,222,654) and in further view of Delavaux et al. (US Patent No: 5,572,612).

Regarding claim 15, Li discloses the end station (32, fig. 2) comprises of a receiver (32, RX, fig. 25) for receiving the information signal (col. 7, lines 40-45). The modified communication system of Li and Frigo differs from the claimed invention in that Li and Frigo do not disclose the end station further includes a polarization independent modulator. Delavaux teaches a polarization independent modulator (39, fig. 1) that generates a modulated upstream signal (col. 3, lines 28-30). Therefore, it would have been obvious to an artisan at the time of invention to incorporate a polarization independent modulator such as the one of Delavaux in the End station 32 of Li in order to generate an upstream modulated light signal.

9. Claim 29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. (US Patent No: 6,616,349) in view of Frigo (US Patent No: 6,222,654) and in further view of Barnard (US Patent No: 6,616,348).

Regarding claim 29, Li teaches the end station (32, figs. 2, 25) comprises of a pair of transceivers (TXs and RXs, fig. 25). The modified communication system of Li and Frigo differs from the claimed invention in that Li and Frigo do not disclose the end station further includes a pair of circulators. Barnard teaches optical circulators (25, 26, 27, 28, fig. 3) that are

connected to an OADM (29, fig. 3). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate optical circulators such as the ones of Barnard in the add/drop and client node 32 of Li modified by Frigo in order to direct diverse optical signals along different optical paths.

Regarding claim 31, Li teaches the end station (32, figs. 2, 25) comprises of a coarse multiplexer and demultiplexer pair (the multiplexer and demultiplexers that are connected to client node 32, shown in fig. 25).

10. Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Applicant's arguments filed 4/15/05 have been fully considered but they are not persuasive.

Remark states access node 50 of Li does not perform multiplexing function and merely serve to connect one ring network to another to facilitate the routing of whatever traffic is on one ring to another ring. Li teaches an interconnect node 50 (the access node) that has a wavelength selective switch card 70 for controlling operation of the interconnect matrices 53-56, wherein each interconnect matrix is a wavelength selective switch matrix (col. 6, lines 1-5). Li further teaches interconnect node 50 includes a pair of demultiplexers 71 for separating traffic into individual wavelength channels Σ_1–Σ_4 (col. 6, lines 12-14). Li further teaches each interconnect wavelength channel Σ_3 and Σ_4 is reserved by the corresponding matrix 55, 56, and routed

between the rings 20, 30, and 40 (col. 6, lines 14-17). Accordingly, interconnect node 50 (or the access node) permits selective wavelength transmission of optical signal from one ring to another, or from feeder ring 20 to distribution ring 30. Remark further states access client 21 of Li is simply one of many optical signal carrier generation devices in the network of fig. 21, and there is no single network node for generating a carrier signal for all ring networks. However, claims 1 and 20, each recites a network node (NN) for providing only optical carrier signals transmitted across optical feeder ring and optical distribution ring. Li teaches communication among client networking elements such as client 21 and IOFs, and each type of communication is placed on a separate wavelength channel Σ_i (col. 4, lines 50-61). Accordingly, node 21 of Li can provide transmission of only optical carrier signal across optical feeder ring and distribution ring, as recited in each of the claims 1 and 20. Applicant attention is directed that features upon which applicant relies (i.e., single network node generating a carrier for all ring networks) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Applicant's attention is directed that during the prosecution of a pending patent application the terms found in the claims should be given the broadest reasonable interpretation, *See in re Pearson,* 181 USPQ 641 (CCPA 1974).

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. R. Sedighian whose telephone number is (571) 272-3034. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M. R. Sedighian

M. R. SEDIGHIAN
PRIMARY EXAMINER